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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/752,656	01/07/2004	Jason A. Polzin	GEMS8081.209	4093

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Ziolkowski Patent Solutions Group, LLC  
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EXAMINER

SHRIVASTAV, BRIJ B

ART UNIT PAPER NUMBER

2859

DATE MAILED: 08/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/752,656

Applicant(s)

POLZIN ET AL.

Examiner

Brij B Shrivastav

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 36-71 is/are pending in the application.
- 4a) Of the above claim(s) 67-71 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 36-63 is/are rejected.
- 7) ☐ Claim(s) 64-66 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                                    | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. Applicants' preliminary amendment dated January 7, 2004 has been received and entered. Applicant has canceled claims 1-35. The pending claims 36-71 are the newly added claims in the application.

### ***Election/Restriction***

2. Authorization for this election of the claims was given in a telephone interview with attorney Mark Wilkinson on August 3, 2004. Accordingly, claims 36-66 are elected, with traverse, for prosecution on their merit. Claims 67-71 are non-elected claims, and will not be considered on their merit in this Office action.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

a) Claims 36 recite the limitation "warping" in line 5. There is insufficient antecedent basis for this limitation in the claim.

b) Claims 36-46 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural imaging means to achieve required function, such omission amounting to a gap between the structural elements to carry out the function. See MPEP § 2172.01. The omitted steps are: imaging means where gradient field is used for image data acquisition, and correction means and steps to correct warping from the acquired image data.

c) Claims 47-60 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential means and functional steps, such omission amounting

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to a gap between the steps. See MPEP § 2172.01. The omitted means and steps are: disorder correction means and steps required to correct MR data disorder.

d) In claims 36 and 47, --'a'-- before the word 'presence' should be replaced with --'the'--.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 36 and 38 are rejected under 35 U.S.C. 102(b) as being anticipated by Grover et al (US 5,200,700).

As regards to claim 36, Glover et al teach a method of correcting gradient non-linearities in image data, including acquiring the image data of a subject in motion in the presence of gradient non-linearities (figures 1-5; columns 1 and 2, lines 30-68, 1-6; column 4-6). Further, Glover et al teach correcting for warping in the acquired image data for the motion induces during data acquisition (figures 5-8; columns 6-10).

As regards to claim 38, Glover et al teach acquisition of MR data affected by variation of the gradient non-linearities (5 and 6).

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5. Claims 61-63 are rejected under 35 U.S.C. 102(e) as being anticipated by Mistretta (US 6,671,536).

As regards to claim 61, Mistretta teaches an MR apparatus having a gradient non-linearity compensation for moving object, including a magnetic resonance imaging system having a plurality of gradient coils positioned about a bore of a magnet to impress a polarizing magnetic field on an RF transceiver system and an RF switch controlled by a pulse module to transmit RF signals to an RF coil assembly to acquire MR images (figure 1, numerals 139, 140, 141, 152 and 154; columns 8 and 9, lines 38-67 and 1-52). Further, Mistretta teaches a moveable table to translate an imaging object about the magnet (figures 1 and 4, numerals 11, 134, column 9, lines 9-17), and a computer programmed to translate the moving table through the bore of the magnet to acquire MR data of an of an imaging object positioned on the moving table as the moving table is translated through the bore of the magnet (figures 1 and 4, numerals 11, 107, 122 and 134). Mistretta furthermore teaches correcting gradient field distortion in the MR data acquired (figure 9, column 12, lines 49-67).

As regards to claims 62 and 63, Mistretta teaches application of GradWarp function to correct motion related gradient non-linearities (column 1, lines 40-67).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 47 and 56-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glover et al (US 5,200,700), and further in view of Mistretta (US 6,671,536).

As regards to claim 47, Glover et al teach acquiring MR data in the presence of gradient non-linearity (gradient fields are non-linear fields), and correcting distortion in the MR data that is acquired in the presence of gradient non-linearity (columns 6 and 7, lines 33-68 and 4-37). However, Glover et al do not teach translating a patient on a moveable table within a magnet. Mistretta teaches translating a patient on a moveable table within a magnet (figures 1 and 4, columns 8 and 9, lines 38-65 and 8-17).

It would have been obvious to one of ordinary skill in the art to adapt moveable table of Mistretta to move the patient within the magnet to an improved control of the patient movement for patient comfort and for correcting field distortions due to gradient non-linearity improving imaging data to improve image quality.

As regards to claims 56 and 60, Glover et al teach correction of distorted data due to gradient non-linearity, and to process the collected data line by line and point by point (figure 6)

As regards to claims 57-59, Glover et al do not further teach distortion correction using GrandWarp function knowing field gradient and table motion. Mistretta teaches distortion correction using GrandWarp function knowing field gradient and table motion (figure 6).

7. Claims 43 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grover et al (US 5,200,700) as applied to claim 36 above, and further in view of Mistretta (US 6,671,536).

As regards to claims 43 and 45, Grover et al specifically do not further teach a moving table and related gradient error calculation. Mistretta teaches a moving table and related gradient error calculation (figures 1 and 4 numeral 11). It would have been obvious to one of ordinary skill in the art to adapt moving table and error calculation of Mistretta with the art of Grover et al to make MRI system more versatile for improved image quality.

***Allowable Subject Matter***

8. Claims 64-66 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

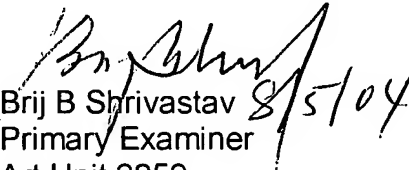
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brij B Shrivastav whose telephone number is 571-272-2250. The examiner can normally be reached on 7 AM to 4 PM.

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11. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego F. F. Gutierrez can be reached on 571-272-2245. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

August 5, 2004

  
Brij B Shrivastav  
Primary Examiner  
Art Unit 2859

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